COOL TOPIC DAY ; SOLUBILITY AND Ksp!

Alright class, today we are starting a new subunit in equilibrium, called Solubility and Ksp.

Basically, in grades previous to 12, we predict the solubility of salts in water based on if its soluble or insoluble. Today we’re learning about the constant which gives us an idea of how much a particular substance will dissolve in a solution.

For example, Calcium fluoride’s solubility would be written like this:

CaF2(s) <-> Ca2+ (aq) + 2 F –(aq)

The Ksp, which stands for Solubility-product constant, only considers the substances that are neither solid nor liquid. So in this case... Ksp=[Ca2+][F-]2

Why is this important? Well... let’s consider toothpaste. Calcium fluoride, which is a solid powdery substance, is similar to fluorides present in some toothpastes. For example, if sodium fluoride, which is present in toothpastes, was not soluble, it would not be capable of forming a paste formula to be used. Imagine having to brush your teeth with disgusting runny liquid which was white and solid in some places and clear and liquid in others. Even in your everyday lives, imagine no solubility. The tea i drink almost every morning wouldn’t be able to be sweetened unless i saturated it... adults would go mad if they couldn’t sweeten their coffee or add milk. Think about putting spices in your spaghetti sauce...

Speaking of spaghetti sauce, the ingredients and spices used in it for flavouring is a great example of what would have a high Ksp ! for example, garlic would have a high Ksp because of the tiny amount you need to give it a flavour boost. Oregano, on the other hand, requires a lot more to add the same amount of flavour as garlic, so its Ksp is smaller than Garlic’s Ksp.

Nevertheless, back to the scientific part of it, the solubility-product constant is equal to the product of the concentrations of the ions involved in the equilibrium, each raised to the power of its coefficient in the equilibrium equation.